

# Work Order ID 147998

Friday, June 17, 2016 8:02:34 AM

**\*147998\***

Page 1

Item ID: D2580-1

Accept

**\*N900040100\***

Setup Start **\*NS1\***

Revision ID:

Item Name: 205 Bent Tube

Stop **\*NS2\***

Start Date: 6/23/2016 Start Qty: 6.00

**\*6\***

Cust Item ID:

Required Date: 6/28/2016 Req'd Qty: 6.00

**\*6\***

Customer:

Reference:

Approvals: Process Plan: MLJ Date: JUN 21 2016 Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

Run Start **\*NR1\***

QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop **\*NR2\***

| Sequence ID/<br>Work Center ID | Operation<br>Description | Set Up/<br>Run Hours | Tool ID | Tool # | Plan<br>Code | Accept<br>Qty | Reject<br>Qty | Reject<br>Number | Insp.<br>Stamp |
|--------------------------------|--------------------------|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|
| Draw Nbr                       | Revision Nbr             |                      |         |        |              |               |               |                  |                |
| D2580                          | G                        |                      |         |        |              |               |               |                  |                |

100

0.00

**\*100\***

Skidtubes

Memo

0.37

Skidtubes

1- Inspect mat'l D2500-1-190 for damage.

2-Drill pilot holes using drill jig DT 8149 A-BC-D

3-Open holes to 0.508" as per Dwg D2580

4-Deburr holes per QSI002 section 4.2.3 and blow out all chips from inside of tube

5- Test fit inspection saddles on FWD & AFT saddle holes using DT9916.

101

QC6- Inspect dimensions to drawing

0.00

**\*101\***

QC

Memo

0.00

Quality Control

DAS  
18  
9-08

6 8 10 16-07-06

DQA: \_\_\_\_\_ Date: \_\_\_\_\_

**WORK ORDER NON-CONFORMANCE / UPDATE**

QA Closed: \_\_\_\_\_ Date: \_\_\_\_\_

Work Order update only ☐

|                                                              |                                 |                                                                                                                                                                                    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                                             |                                           |                                                                                                                    |                                     |                                           |                                        |                                             |                                   |                                       |                                   |                                   |                                          |                                           |                                  |                                              |                                              |                                                |                                   |                                          |                                  |                                                |                                 |                                                 |                                |                                   |                                     |                                             |                                        |                                           |                                 |                                    |                                               |                                                            |                                        |                                      |                                        |                                                          |                                      |                                           |                                        |                                |                               |                                             |                                          |                                  |                                     |                                       |                                                |                                           |                                             |                                               |                                         |                                            |                                     |                                  |                                 |                                  |                                           |
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| Work Order: _____<br><br>Part No. _____<br><br>NCR No. _____ |                                 | <b>DISPOSITION</b><br><br>Rework <input type="checkbox"/><br>Scrap <input type="checkbox"/><br>Use-as-is <input type="checkbox"/><br>Suspected Unapproved <input type="checkbox"/> |                                        | <b>AGAINST DEPARTMENT/PROCESS</b><br><br><div style="display: flex; justify-content: space-between;"> <div>           Skid-tube <input type="checkbox"/><br/>           Machining <input type="checkbox"/><br/>           Thermoforming <input type="checkbox"/><br/>           Large Fab <input type="checkbox"/> </div> <div>           Cross tube <input type="checkbox"/><br/>           Small Fab <input type="checkbox"/><br/>           Finishing <input type="checkbox"/><br/>           Composite <input type="checkbox"/> </div> <div>           Water Jet <input type="checkbox"/><br/>           Prod. Eng. Coord. <input type="checkbox"/><br/>           Rec/Store/Packaging <input type="checkbox"/><br/>           Supplier <input type="checkbox"/> </div> <div>           Engineering <input type="checkbox"/><br/>           Quality <input type="checkbox"/><br/>           Other <input type="checkbox"/> </div> </div> |                                   |                                             |                                           |                                                                                                                    |                                     |                                           |                                        |                                             |                                   |                                       |                                   |                                   |                                          |                                           |                                  |                                              |                                              |                                                |                                   |                                          |                                  |                                                |                                 |                                                 |                                |                                   |                                     |                                             |                                        |                                           |                                 |                                    |                                               |                                                            |                                        |                                      |                                        |                                                          |                                      |                                           |                                        |                                |                               |                                             |                                          |                                  |                                     |                                       |                                                |                                           |                                             |                                               |                                         |                                            |                                     |                                  |                                 |                                  |                                           |
| Date :                                                       |                                 | Step #:                                                                                                                                                                            |                                        | QTY Effective :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                                             |                                           | MRB (QSI042) Approval                                                                                              |                                     |                                           |                                        |                                             |                                   |                                       |                                   |                                   |                                          |                                           |                                  |                                              |                                              |                                                |                                   |                                          |                                  |                                                |                                 |                                                 |                                |                                   |                                     |                                             |                                        |                                           |                                 |                                    |                                               |                                                            |                                        |                                      |                                        |                                                          |                                      |                                           |                                        |                                |                               |                                             |                                          |                                  |                                     |                                       |                                                |                                           |                                             |                                               |                                         |                                            |                                     |                                  |                                 |                                  |                                           |
| Description Work Order Deviation                             |                                 |                                                                                                                                                                                    |                                        | Disposition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                   |                                             |                                           | Completed By<br><br><br>Lead hand / Supervisor<br>Approval Verification<br><br><br>QC / QA Coordinator<br>Approval |                                     |                                           |                                        |                                             |                                   |                                       |                                   |                                   |                                          |                                           |                                  |                                              |                                              |                                                |                                   |                                          |                                  |                                                |                                 |                                                 |                                |                                   |                                     |                                             |                                        |                                           |                                 |                                    |                                               |                                                            |                                        |                                      |                                        |                                                          |                                      |                                           |                                        |                                |                               |                                             |                                          |                                  |                                     |                                       |                                                |                                           |                                             |                                               |                                         |                                            |                                     |                                  |                                 |                                  |                                           |
|                                                              |                                 |                                                                                                                                                                                    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                                             |                                           |                                                                                                                    |                                     |                                           |                                        |                                             |                                   |                                       |                                   |                                   |                                          |                                           |                                  |                                              |                                              |                                                |                                   |                                          |                                  |                                                |                                 |                                                 |                                |                                   |                                     |                                             |                                        |                                           |                                 |                                    |                                               |                                                            |                                        |                                      |                                        |                                                          |                                      |                                           |                                        |                                |                               |                                             |                                          |                                  |                                     |                                       |                                                |                                           |                                             |                                               |                                         |                                            |                                     |                                  |                                 |                                  |                                           |
|                                                              |                                 |                                                                                                                                                                                    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                                             |                                           |                                                                                                                    |                                     |                                           |                                        |                                             |                                   |                                       |                                   |                                   |                                          |                                           |                                  |                                              |                                              |                                                |                                   |                                          |                                  |                                                |                                 |                                                 |                                |                                   |                                     |                                             |                                        |                                           |                                 |                                    |                                               |                                                            |                                        |                                      |                                        |                                                          |                                      |                                           |                                        |                                |                               |                                             |                                          |                                  |                                     |                                       |                                                |                                           |                                             |                                               |                                         |                                            |                                     |                                  |                                 |                                  |                                           |
| Root Cause                                                   |                                 | FAULT CATEGORY                                                                                                                                                                     |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                                             |                                           |                                                                                                                    |                                     |                                           |                                        |                                             |                                   |                                       |                                   |                                   |                                          |                                           |                                  |                                              |                                              |                                                |                                   |                                          |                                  |                                                |                                 |                                                 |                                |                                   |                                     |                                             |                                        |                                           |                                 |                                    |                                               |                                                            |                                        |                                      |                                        |                                                          |                                      |                                           |                                        |                                |                               |                                             |                                          |                                  |                                     |                                       |                                                |                                           |                                             |                                               |                                         |                                            |                                     |                                  |                                 |                                  |                                           |
| Environment <input type="checkbox"/>                         | Design <input type="checkbox"/> | Doc/Data <input type="checkbox"/>                                                                                                                                                  | Equip/Tooling <input type="checkbox"/> | Handling/Pre <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Material <input type="checkbox"/> | Internal Transport <input type="checkbox"/> | Tribal Knowledge <input type="checkbox"/> | LOA <input type="checkbox"/>                                                                                       | Substation <input type="checkbox"/> | Past Expiry Date <input type="checkbox"/> | Misidentified <input type="checkbox"/> | No Re-verification <input type="checkbox"/> | Operator <input type="checkbox"/> | Offset/Setup <input type="checkbox"/> | Supplier <input type="checkbox"/> | Training <input type="checkbox"/> | Use for Testing <input type="checkbox"/> | Poor Information <input type="checkbox"/> | Rushing <input type="checkbox"/> | Product Improvement <input type="checkbox"/> | Process Improvement <input type="checkbox"/> | Manufacturing Process <input type="checkbox"/> | Past Due <input type="checkbox"/> | Pressure/Forced <input type="checkbox"/> | Bending <input type="checkbox"/> | Centre Not Concentric <input type="checkbox"/> | Cracks <input type="checkbox"/> | Crimp/Kink/Ripple/Wave <input type="checkbox"/> | Cuffs <input type="checkbox"/> | Crushing <input type="checkbox"/> | Heat Treat <input type="checkbox"/> | Wave/Twist in Tube <input type="checkbox"/> | Marks/Chatter <input type="checkbox"/> | Temperature/Cure <input type="checkbox"/> | Set-up <input type="checkbox"/> | BOM/Route <input type="checkbox"/> | Broken/Damage/Defect <input type="checkbox"/> | Inspection Incomplete/Unqualified <input type="checkbox"/> | Contamination <input type="checkbox"/> | Countersink <input type="checkbox"/> | Cut Too Short <input type="checkbox"/> | Instructions Incomplete/Unclear <input type="checkbox"/> | Drill Holes <input type="checkbox"/> | Power Loss/Surge <input type="checkbox"/> | Folio/Program <input type="checkbox"/> | Grain <input type="checkbox"/> | Weld <input type="checkbox"/> | Wrong Stock Pulled <input type="checkbox"/> | Out of Sequence <input type="checkbox"/> | Off-set <input type="checkbox"/> | Mislabeled <input type="checkbox"/> | Fit/Function <input type="checkbox"/> | Misaligned/off center <input type="checkbox"/> | Positioned Wrong <input type="checkbox"/> | Outside Dimensions <input type="checkbox"/> | Over/Under tolerance <input type="checkbox"/> | Part Incorrect <input type="checkbox"/> | Part Lost/Missing <input type="checkbox"/> | Part Moved <input type="checkbox"/> | Drawing <input type="checkbox"/> | Finish <input type="checkbox"/> | Misread <input type="checkbox"/> | Turning Sequence <input type="checkbox"/> |
|                                                              |                                 |                                                                                                                                                                                    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                                             |                                           |                                                                                                                    |                                     |                                           |                                        |                                             |                                   |                                       |                                   |                                   |                                          |                                           |                                  |                                              |                                              | OTHER :                                        |                                   |                                          |                                  |                                                |                                 |                                                 |                                |                                   |                                     |                                             |                                        |                                           |                                 |                                    |                                               |                                                            |                                        |                                      |                                        |                                                          |                                      |                                           |                                        |                                |                               |                                             |                                          |                                  |                                     |                                       |                                                |                                           |                                             |                                               |                                         |                                            |                                     |                                  |                                 |                                  |                                           |

# Work Order ID 147998

Friday, June 17, 2016 8:02:34 AM

**\*147998\***

Page 2

Item ID: D2580-1

Accept

**\*N900040100\***

Setup Start

**\*NS1\***

Revision ID:

Stop

**\*NS2\***

Item Name: 205 Bent Tube

Start Date: 6/23/2016 Start Qty: 6.00

**\*6\***

Cust Item ID:

Required Date: 6/28/2016 Req'd Qty: 6.00

**\*6\***

Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run

Start

**\*NR1\***

QC:

Date:

SPC (Y/N):

Date:

Stop

**\*NR2\***

Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Tool ID

Tool #

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

110

Chemical Conversion Coat per QSI005 4.1

0.00

**\*110\***

HandFinish

Memo

0.26

Hand Finishing

120

QC7-Inspect Chemical Conversion Coat

0.00

**\*120\***

QC

Memo

0.01

Quality Control

125

0.00

**\*125\***

Skidtubes

Memo

0.24

Skidtubes

1- Bond web in place per QSI 015.

A/R Sikaflex-291 batch: 134743

Sikaflex expire date: 16-12-8

Start time and date: 16-7-7 bond for 12hrs

DAS  
18  
9-89

6 16-07-06

16-7-7 M.G.

DQA: \_\_\_\_\_ Date: \_\_\_\_\_



### WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: \_\_\_\_\_ Date: \_\_\_\_\_

Work Order update only ☐

|                                             |                                                |                                                 |                                                            |                                                |                                               |                                              |                                      |                                              |  |  |  |
|---------------------------------------------|------------------------------------------------|-------------------------------------------------|------------------------------------------------------------|------------------------------------------------|-----------------------------------------------|----------------------------------------------|--------------------------------------|----------------------------------------------|--|--|--|
| Work Order: _____                           |                                                | DISPOSITION                                     |                                                            | AGAINST DEPARTMENT/PROCESS                     |                                               |                                              |                                      |                                              |  |  |  |
| Part No. _____                              |                                                | Rework <input type="checkbox"/>                 |                                                            | Skid-tube <input type="checkbox"/>             | Cross tube <input type="checkbox"/>           | Water Jet <input type="checkbox"/>           | Engineering <input type="checkbox"/> |                                              |  |  |  |
| NCR No. _____                               |                                                | Scrap <input type="checkbox"/>                  |                                                            | Machining <input type="checkbox"/>             | Small Fab <input type="checkbox"/>            | Prod. Eng. Coord. <input type="checkbox"/>   | Quality <input type="checkbox"/>     |                                              |  |  |  |
|                                             |                                                | Use-as-is <input type="checkbox"/>              |                                                            | Thermoforming <input type="checkbox"/>         | Finishing <input type="checkbox"/>            | Rec/Store/Packaging <input type="checkbox"/> | Other <input type="checkbox"/>       |                                              |  |  |  |
|                                             |                                                | Suspected Unapproved <input type="checkbox"/>   |                                                            | Large Fab <input type="checkbox"/>             | Composite <input type="checkbox"/>            | Supplier <input type="checkbox"/>            |                                      |                                              |  |  |  |
| Date :                                      |                                                | Step #:                                         |                                                            | QTY Effective :                                |                                               |                                              | MRB (QSI042) Approval                |                                              |  |  |  |
| Description Work Order Deviation            |                                                |                                                 |                                                            | Disposition                                    |                                               |                                              |                                      |                                              |  |  |  |
|                                             |                                                |                                                 |                                                            |                                                |                                               |                                              |                                      |                                              |  |  |  |
|                                             |                                                |                                                 |                                                            |                                                |                                               |                                              |                                      | Completed By                                 |  |  |  |
|                                             |                                                |                                                 |                                                            |                                                |                                               |                                              |                                      | Lead hand / Supervisor Approval Verification |  |  |  |
|                                             |                                                |                                                 |                                                            | QC / QA Coordinator Approval                   |                                               |                                              |                                      |                                              |  |  |  |
| Root Cause                                  |                                                | FAULT CATEGORY                                  |                                                            |                                                |                                               |                                              |                                      |                                              |  |  |  |
| Environment <input type="checkbox"/>        | <input type="checkbox"/> No Re-verification    | <input type="checkbox"/> Pressure/Forced        | <input type="checkbox"/> Temperature/Cure                  | <input type="checkbox"/> Power Loss/Surge      | <input type="checkbox"/> Positioned Wrong     |                                              |                                      |                                              |  |  |  |
| Design <input type="checkbox"/>             | <input type="checkbox"/> Operator              | <input type="checkbox"/> Bending                | <input type="checkbox"/> Set-up                            | <input type="checkbox"/> Folio/Program         | <input type="checkbox"/> Outside Dimensions   |                                              |                                      |                                              |  |  |  |
| Doc/Data <input type="checkbox"/>           | <input type="checkbox"/> Offset/Setup          | <input type="checkbox"/> Centre Not Concentric  | <input type="checkbox"/> BOM/Route                         | <input type="checkbox"/> Grain                 | <input type="checkbox"/> Over/Under tolerance |                                              |                                      |                                              |  |  |  |
| Equip/Tooling <input type="checkbox"/>      | <input type="checkbox"/> Supplier              | <input type="checkbox"/> Cracks                 | <input type="checkbox"/> Broken/Damage/Defect              | <input type="checkbox"/> Weld                  | <input type="checkbox"/> Part Incorrect       |                                              |                                      |                                              |  |  |  |
| Handling/Pre <input type="checkbox"/>       | <input type="checkbox"/> Training              | <input type="checkbox"/> Crimp/Kink/Ripple/Wave | <input type="checkbox"/> Inspection Incomplete/Unqualified | <input type="checkbox"/> Wrong Stock Pulled    | <input type="checkbox"/> Part Lost/Missing    |                                              |                                      |                                              |  |  |  |
| Material <input type="checkbox"/>           | <input type="checkbox"/> Use for Testing       | <input type="checkbox"/> Cuffs                  | <input type="checkbox"/> Contamination                     | <input type="checkbox"/> Out of Sequence       | <input type="checkbox"/> Part Moved           |                                              |                                      |                                              |  |  |  |
| Internal Transport <input type="checkbox"/> | <input type="checkbox"/> Poor Information      | <input type="checkbox"/> Crushing               | <input type="checkbox"/> Countersink                       | <input type="checkbox"/> Off-set               | <input type="checkbox"/> Drawing              |                                              |                                      |                                              |  |  |  |
| Tribal Knowledge <input type="checkbox"/>   | <input type="checkbox"/> Rushing               | <input type="checkbox"/> Heat Treat             | <input type="checkbox"/> Cut Too Short                     | <input type="checkbox"/> Mislabeled            | <input type="checkbox"/> Finish               |                                              |                                      |                                              |  |  |  |
| LOA <input type="checkbox"/>                | <input type="checkbox"/> Product Improvement   | <input type="checkbox"/> Wave/Twist in Tube     | <input type="checkbox"/> Instructions Incomplete/Unclear   | <input type="checkbox"/> Fit/Function          | <input type="checkbox"/> Misread              |                                              |                                      |                                              |  |  |  |
| Substation <input type="checkbox"/>         | <input type="checkbox"/> Process Improvement   | <input type="checkbox"/> Marks/Chatter          | <input type="checkbox"/> Drill Holes                       | <input type="checkbox"/> Misaligned/off center | <input type="checkbox"/> Turning Sequence     |                                              |                                      |                                              |  |  |  |
| Past Expiry Date <input type="checkbox"/>   | <input type="checkbox"/> Manufacturing Process |                                                 |                                                            |                                                |                                               |                                              |                                      |                                              |  |  |  |
| Misidentified <input type="checkbox"/>      | <input type="checkbox"/> Past Due              | OTHER :                                         |                                                            |                                                |                                               |                                              |                                      |                                              |  |  |  |

# Work Order ID 147998

Friday, June 17, 2016 8:02:34 AM

**\*147998\***

Page 3

Item ID: D2580-1 Accept **\*N900040100\*** Setup Start **\*NS1\***  
 Revision ID: Stop **\*NS2\***  
 Item Name: 205 Bent Tube  
 Start Date: 6/23/2016 Start Qty: 6.00 **\*6\*** Cust Item ID:  
 Required Date: 6/28/2016 Req'd Qty: 6.00 **\*6\*** Customer:  
 Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_ Run Start **\*NR1\***  
 QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_ Stop **\*NR2\***

| Sequence ID/<br>Work Center ID | Operation<br>Description                           | Set Up/<br>Run Hours | Tool ID | Tool # | Plan<br>Code | Accept<br>Qty | Reject<br>Qty | Reject<br>Number | Insp.<br>Stamp | DAS<br>18<br>9-89 |
|--------------------------------|----------------------------------------------------|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|-------------------|
| 130                            | QC5- Inspect part completeness to step on W/O      | 0.00                 |         |        |              |               |               |                  |                |                   |
| <b>*130*</b>                   |                                                    |                      |         |        |              |               |               |                  |                |                   |
| QC                             | Memo                                               | 0.02                 |         |        |              |               |               |                  |                |                   |
| Quality Control                |                                                    |                      |         |        |              |               |               |                  |                |                   |
| 140                            | Identify as per dwg & Stock Location: <u>LG002</u> | 0.00                 |         |        |              |               |               |                  |                |                   |
| <b>*140*</b>                   |                                                    |                      |         |        |              |               |               |                  |                |                   |
| Packaging                      | Memo                                               | 0.01                 |         |        |              |               |               |                  |                |                   |
| Packaging                      | LOCATION : LG002                                   |                      |         |        |              |               |               |                  |                |                   |
| 150                            | QC21- Final Inspection - Work Order Release        | 0.00                 |         |        |              |               |               |                  |                |                   |
| <b>*150*</b>                   |                                                    |                      |         |        |              |               |               |                  |                |                   |
| QC                             | Memo                                               | 0.10                 |         |        |              |               |               |                  |                |                   |
| Quality Control                |                                                    |                      |         |        |              |               |               |                  |                |                   |

DAS JUL 11 2016  
 21  
 9-89

DQA: \_\_\_\_\_ Date: \_\_\_\_\_

**WORK ORDER NON-CONFORMANCE / UPDATE**

QA Closed: \_\_\_\_\_ Date: \_\_\_\_\_

Work Order update only ☐

|                                                              |  |                                                                                                                                                                                    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |                                                                                                                                                     |  |  |
|--------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|-----------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
| Work Order: _____<br><br>Part No. _____<br><br>NCR No. _____ |  | <b>DISPOSITION</b><br><br>Rework <input type="checkbox"/><br>Scrap <input type="checkbox"/><br>Use-as-is <input type="checkbox"/><br>Suspected Unapproved <input type="checkbox"/> |  | <b>AGAINST DEPARTMENT/PROCESS</b><br><br><div style="display: flex; justify-content: space-between;"> <div>             Skid-tube <input type="checkbox"/><br/>             Machining <input type="checkbox"/><br/>             Thermoforming <input type="checkbox"/><br/>             Large Fab <input type="checkbox"/> </div> <div>             Cross tube <input type="checkbox"/><br/>             Small Fab <input type="checkbox"/><br/>             Finishing <input type="checkbox"/><br/>             Composite <input type="checkbox"/> </div> <div>             Water Jet <input type="checkbox"/><br/>             Prod. Eng. Coord. <input type="checkbox"/><br/>             Rec/Store/Packaging <input type="checkbox"/><br/>             Supplier <input type="checkbox"/> </div> <div>             Engineering <input type="checkbox"/><br/>             Quality <input type="checkbox"/><br/>             Other <input type="checkbox"/> </div> </div> |  |  |                                                                                                                                                     |  |  |
| Date :                                                       |  | Step #:                                                                                                                                                                            |  | QTY Effective :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  | MRB (QSI042) Approval<br><br><br>Completed By<br><br><br>Lead hand / Supervisor<br>Approval Verification<br><br><br>QC / QA Coordinator<br>Approval |  |  |
| Description Work Order Deviation                             |  |                                                                                                                                                                                    |  | Disposition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |                                                                                                                                                     |  |  |
|                                                              |  |                                                                                                                                                                                    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |                                                                                                                                                     |  |  |

| Root Cause                                  |                          |                                                |                          | FAULT CATEGORY                                  |                          |                                                            |                          |
|---------------------------------------------|--------------------------|------------------------------------------------|--------------------------|-------------------------------------------------|--------------------------|------------------------------------------------------------|--------------------------|
| <input type="checkbox"/> Environment        | <input type="checkbox"/> | <input type="checkbox"/> No Re-verification    | <input type="checkbox"/> | <input type="checkbox"/> Pressure/Forced        | <input type="checkbox"/> | <input type="checkbox"/> Temperature/Cure                  | <input type="checkbox"/> |
| <input type="checkbox"/> Design             | <input type="checkbox"/> | <input type="checkbox"/> Operator              | <input type="checkbox"/> | <input type="checkbox"/> Bending                | <input type="checkbox"/> | <input type="checkbox"/> Set-up                            | <input type="checkbox"/> |
| <input type="checkbox"/> Doc/Data           | <input type="checkbox"/> | <input type="checkbox"/> Offset/Setup          | <input type="checkbox"/> | <input type="checkbox"/> Centre Not Concentric  | <input type="checkbox"/> | <input type="checkbox"/> BOM/Route                         | <input type="checkbox"/> |
| <input type="checkbox"/> Equip/Tooling      | <input type="checkbox"/> | <input type="checkbox"/> Supplier              | <input type="checkbox"/> | <input type="checkbox"/> Cracks                 | <input type="checkbox"/> | <input type="checkbox"/> Broken/Damage/Defect              | <input type="checkbox"/> |
| <input type="checkbox"/> Handling/Pre       | <input type="checkbox"/> | <input type="checkbox"/> Training              | <input type="checkbox"/> | <input type="checkbox"/> Crimp/Kink/Ripple/Wave | <input type="checkbox"/> | <input type="checkbox"/> Inspection Incomplete/Unqualified | <input type="checkbox"/> |
| <input type="checkbox"/> Material           | <input type="checkbox"/> | <input type="checkbox"/> Use for Testing       | <input type="checkbox"/> | <input type="checkbox"/> Cuffs                  | <input type="checkbox"/> | <input type="checkbox"/> Contamination                     | <input type="checkbox"/> |
| <input type="checkbox"/> Internal Transport | <input type="checkbox"/> | <input type="checkbox"/> Poor Information      | <input type="checkbox"/> | <input type="checkbox"/> Crushing               | <input type="checkbox"/> | <input type="checkbox"/> Countersink                       | <input type="checkbox"/> |
| <input type="checkbox"/> Tribal Knowledge   | <input type="checkbox"/> | <input type="checkbox"/> Rushing               | <input type="checkbox"/> | <input type="checkbox"/> Heat Treat             | <input type="checkbox"/> | <input type="checkbox"/> Cut Too Short                     | <input type="checkbox"/> |
| <input type="checkbox"/> LOA                | <input type="checkbox"/> | <input type="checkbox"/> Product Improvement   | <input type="checkbox"/> | <input type="checkbox"/> Wave/Twist in Tube     | <input type="checkbox"/> | <input type="checkbox"/> Instructions Incomplete/Unclear   | <input type="checkbox"/> |
| <input type="checkbox"/> Substation         | <input type="checkbox"/> | <input type="checkbox"/> Process Improvement   | <input type="checkbox"/> | <input type="checkbox"/> Marks/Chatter          | <input type="checkbox"/> | <input type="checkbox"/> Drill Holes                       | <input type="checkbox"/> |
| <input type="checkbox"/> Past Expiry Date   | <input type="checkbox"/> | <input type="checkbox"/> Manufacturing Process | <input type="checkbox"/> | OTHER : _____<br>_____<br>_____                 |                          |                                                            |                          |
| <input type="checkbox"/> Misidentified      | <input type="checkbox"/> | <input type="checkbox"/> Past Due              | <input type="checkbox"/> |                                                 |                          |                                                            |                          |

# Picklist Print

Friday, June 17, 2016 8:02:34 AM

Page 1

Work Order ID: 147998

**\*147998\***

Parent Item: D2580-1

**\*D2580-1\***

Parent Item Name: 205 Bent Tube

Start Date: 6/23/2016

Required Date: 6/28/2016

Start Qty: 6.00

Required Qty: 6.00

Comments: IPP B01.11.08 Revised Step 9, 10, 12, and 13 SM IPP Rev:C  
10.12.01 as per DEO D1 DD ver:ec

| Component Item ID/<br>Item Name | Replacement<br>Item ID | Mfg/<br>Purch | Bin<br>Item | Primary<br>Location | Last<br>Location | Route<br>Seq ID | Unit of<br>Measure | Qty on<br>Hand | Qty per Kit | Total<br>Qty | Qty<br>Issued | Date<br>Issued | Status |
|---------------------------------|------------------------|---------------|-------------|---------------------|------------------|-----------------|--------------------|----------------|-------------|--------------|---------------|----------------|--------|
|---------------------------------|------------------------|---------------|-------------|---------------------|------------------|-----------------|--------------------|----------------|-------------|--------------|---------------|----------------|--------|

D2500-1-190

Manufactured No

100

Each

37.0000

1

6

**\*D2500-1-190\***

**\*\***

16-7-5 M.G

Ext'n -I' Beam Tube 4"

Location

Loc Qty

Loc Code

LG002

37

140538

37

D2596

Manufactured No

100

Each

6.0000

1

6

**\*D2596\***

**\*\***

16-7-7 M.G

Web, 205 Skidtube

Location

Loc Qty

Loc Code

LG

6

145029

4

145723

2

147392

4

DQA: \_\_\_\_\_ Date: \_\_\_\_\_



## WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: \_\_\_\_\_ Date: \_\_\_\_\_

Work Order update only ☐

|                                                              |                                 |                                                                                                                                                                                    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                   |                                             |                                           |                                                                                                                    |                                     |                                           |                                        |                                             |                                   |                                       |                                   |                                   |                                          |                                           |                                  |                                              |                                              |                                                |                                   |                                          |                                  |                                                |                                 |                                                 |                                |                                   |                                     |                                             |                                        |                                           |                                 |                                    |                                               |                                                            |                                        |                                      |                                        |                                                          |                                      |                                           |                                        |                                |                               |                                             |                                          |                                  |                                     |                                       |                                                |                                           |                                             |                                               |                                         |                                            |                                     |                                  |                                 |                                  |                                           |
|--------------------------------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------------------------------------|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------------------------------------------|----------------------------------------|---------------------------------------------|-----------------------------------|---------------------------------------|-----------------------------------|-----------------------------------|------------------------------------------|-------------------------------------------|----------------------------------|----------------------------------------------|----------------------------------------------|------------------------------------------------|-----------------------------------|------------------------------------------|----------------------------------|------------------------------------------------|---------------------------------|-------------------------------------------------|--------------------------------|-----------------------------------|-------------------------------------|---------------------------------------------|----------------------------------------|-------------------------------------------|---------------------------------|------------------------------------|-----------------------------------------------|------------------------------------------------------------|----------------------------------------|--------------------------------------|----------------------------------------|----------------------------------------------------------|--------------------------------------|-------------------------------------------|----------------------------------------|--------------------------------|-------------------------------|---------------------------------------------|------------------------------------------|----------------------------------|-------------------------------------|---------------------------------------|------------------------------------------------|-------------------------------------------|---------------------------------------------|-----------------------------------------------|-----------------------------------------|--------------------------------------------|-------------------------------------|----------------------------------|---------------------------------|----------------------------------|-------------------------------------------|
| Work Order: _____<br><br>Part No. _____<br><br>NCR No. _____ |                                 | <b>DISPOSITION</b><br><br>Rework <input type="checkbox"/><br>Scrap <input type="checkbox"/><br>Use-as-is <input type="checkbox"/><br>Suspected Unapproved <input type="checkbox"/> |                                        | <b>AGAINST DEPARTMENT/PROCESS</b><br><br><div style="display: flex; justify-content: space-between;"> <div>             Skid-tube <input type="checkbox"/><br/>             Machining <input type="checkbox"/><br/>             Thermoforming <input type="checkbox"/><br/>             Large Fab <input type="checkbox"/> </div> <div>             Cross tube <input type="checkbox"/><br/>             Small Fab <input type="checkbox"/><br/>             Finishing <input type="checkbox"/><br/>             Composite <input type="checkbox"/> </div> <div>             Water Jet <input type="checkbox"/><br/>             Prod. Eng. Coord. <input type="checkbox"/><br/>             Rec/Store/Packaging <input type="checkbox"/><br/>             Supplier <input type="checkbox"/> </div> <div>             Engineering <input type="checkbox"/><br/>             Quality <input type="checkbox"/><br/>             Other <input type="checkbox"/> </div> </div> |                                   |                                             |                                           |                                                                                                                    |                                     |                                           |                                        |                                             |                                   |                                       |                                   |                                   |                                          |                                           |                                  |                                              |                                              |                                                |                                   |                                          |                                  |                                                |                                 |                                                 |                                |                                   |                                     |                                             |                                        |                                           |                                 |                                    |                                               |                                                            |                                        |                                      |                                        |                                                          |                                      |                                           |                                        |                                |                               |                                             |                                          |                                  |                                     |                                       |                                                |                                           |                                             |                                               |                                         |                                            |                                     |                                  |                                 |                                  |                                           |
| Date :                                                       |                                 | Step #:                                                                                                                                                                            |                                        | QTY Effective :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                   |                                             | MRB (QSI042) Approval                     |                                                                                                                    |                                     |                                           |                                        |                                             |                                   |                                       |                                   |                                   |                                          |                                           |                                  |                                              |                                              |                                                |                                   |                                          |                                  |                                                |                                 |                                                 |                                |                                   |                                     |                                             |                                        |                                           |                                 |                                    |                                               |                                                            |                                        |                                      |                                        |                                                          |                                      |                                           |                                        |                                |                               |                                             |                                          |                                  |                                     |                                       |                                                |                                           |                                             |                                               |                                         |                                            |                                     |                                  |                                 |                                  |                                           |
| Description Work Order Deviation                             |                                 |                                                                                                                                                                                    |                                        | Disposition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                   |                                             |                                           | Completed By<br><br><br>Lead hand / Supervisor<br>Approval Verification<br><br><br>QC / QA Coordinator<br>Approval |                                     |                                           |                                        |                                             |                                   |                                       |                                   |                                   |                                          |                                           |                                  |                                              |                                              |                                                |                                   |                                          |                                  |                                                |                                 |                                                 |                                |                                   |                                     |                                             |                                        |                                           |                                 |                                    |                                               |                                                            |                                        |                                      |                                        |                                                          |                                      |                                           |                                        |                                |                               |                                             |                                          |                                  |                                     |                                       |                                                |                                           |                                             |                                               |                                         |                                            |                                     |                                  |                                 |                                  |                                           |
|                                                              |                                 |                                                                                                                                                                                    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                   |                                             |                                           |                                                                                                                    |                                     |                                           |                                        |                                             |                                   |                                       |                                   |                                   |                                          |                                           |                                  |                                              |                                              |                                                |                                   |                                          |                                  |                                                |                                 |                                                 |                                |                                   |                                     |                                             |                                        |                                           |                                 |                                    |                                               |                                                            |                                        |                                      |                                        |                                                          |                                      |                                           |                                        |                                |                               |                                             |                                          |                                  |                                     |                                       |                                                |                                           |                                             |                                               |                                         |                                            |                                     |                                  |                                 |                                  |                                           |
|                                                              |                                 |                                                                                                                                                                                    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                   |                                             |                                           |                                                                                                                    |                                     |                                           |                                        |                                             |                                   |                                       |                                   |                                   |                                          |                                           |                                  |                                              |                                              |                                                |                                   |                                          |                                  |                                                |                                 |                                                 |                                |                                   |                                     |                                             |                                        |                                           |                                 |                                    |                                               |                                                            |                                        |                                      |                                        |                                                          |                                      |                                           |                                        |                                |                               |                                             |                                          |                                  |                                     |                                       |                                                |                                           |                                             |                                               |                                         |                                            |                                     |                                  |                                 |                                  |                                           |
| Root Cause                                                   |                                 | FAULT CATEGORY                                                                                                                                                                     |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                   |                                             |                                           |                                                                                                                    |                                     |                                           |                                        |                                             |                                   |                                       |                                   |                                   |                                          |                                           |                                  |                                              |                                              |                                                |                                   |                                          |                                  |                                                |                                 |                                                 |                                |                                   |                                     |                                             |                                        |                                           |                                 |                                    |                                               |                                                            |                                        |                                      |                                        |                                                          |                                      |                                           |                                        |                                |                               |                                             |                                          |                                  |                                     |                                       |                                                |                                           |                                             |                                               |                                         |                                            |                                     |                                  |                                 |                                  |                                           |
| Environment <input type="checkbox"/>                         | Design <input type="checkbox"/> | Doc/Data <input type="checkbox"/>                                                                                                                                                  | Equip/Tooling <input type="checkbox"/> | Handling/Pre <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Material <input type="checkbox"/> | Internal Transport <input type="checkbox"/> | Tribal Knowledge <input type="checkbox"/> | LOA <input type="checkbox"/>                                                                                       | Substation <input type="checkbox"/> | Past Expiry Date <input type="checkbox"/> | Misidentified <input type="checkbox"/> | No Re-verification <input type="checkbox"/> | Operator <input type="checkbox"/> | Offset/Setup <input type="checkbox"/> | Supplier <input type="checkbox"/> | Training <input type="checkbox"/> | Use for Testing <input type="checkbox"/> | Poor Information <input type="checkbox"/> | Rushing <input type="checkbox"/> | Product Improvement <input type="checkbox"/> | Process Improvement <input type="checkbox"/> | Manufacturing Process <input type="checkbox"/> | Past Due <input type="checkbox"/> | Pressure/Forced <input type="checkbox"/> | Bending <input type="checkbox"/> | Centre Not Concentric <input type="checkbox"/> | Cracks <input type="checkbox"/> | Crimp/Kink/Ripple/Wave <input type="checkbox"/> | Cuffs <input type="checkbox"/> | Crushing <input type="checkbox"/> | Heat Treat <input type="checkbox"/> | Wave/Twist in Tube <input type="checkbox"/> | Marks/Chatter <input type="checkbox"/> | Temperature/Cure <input type="checkbox"/> | Set-up <input type="checkbox"/> | BOM/Route <input type="checkbox"/> | Broken/Damage/Defect <input type="checkbox"/> | Inspection Incomplete/Unqualified <input type="checkbox"/> | Contamination <input type="checkbox"/> | Countersink <input type="checkbox"/> | Cut Too Short <input type="checkbox"/> | Instructions Incomplete/Unclear <input type="checkbox"/> | Drill Holes <input type="checkbox"/> | Power Loss/Surge <input type="checkbox"/> | Folio/Program <input type="checkbox"/> | Grain <input type="checkbox"/> | Weld <input type="checkbox"/> | Wrong Stock Pulled <input type="checkbox"/> | Out of Sequence <input type="checkbox"/> | Off-set <input type="checkbox"/> | Mislabeled <input type="checkbox"/> | Fit/Function <input type="checkbox"/> | Misaligned/off center <input type="checkbox"/> | Positioned Wrong <input type="checkbox"/> | Outside Dimensions <input type="checkbox"/> | Over/Under tolerance <input type="checkbox"/> | Part Incorrect <input type="checkbox"/> | Part Lost/Missing <input type="checkbox"/> | Part Moved <input type="checkbox"/> | Drawing <input type="checkbox"/> | Finish <input type="checkbox"/> | Misread <input type="checkbox"/> | Turning Sequence <input type="checkbox"/> |
|                                                              |                                 |                                                                                                                                                                                    |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                   |                                             |                                           |                                                                                                                    |                                     |                                           |                                        |                                             |                                   |                                       |                                   |                                   |                                          |                                           |                                  |                                              |                                              |                                                |                                   | OTHER :                                  |                                  |                                                |                                 |                                                 |                                |                                   |                                     |                                             |                                        |                                           |                                 |                                    |                                               |                                                            |                                        |                                      |                                        |                                                          |                                      |                                           |                                        |                                |                               |                                             |                                          |                                  |                                     |                                       |                                                |                                           |                                             |                                               |                                         |                                            |                                     |                                  |                                 |                                  |                                           |



| LIST OF MATERIALS |             |             |             |             |  | PART NUMBER                                                               | DESCRIPTION         |
|-------------------|-------------|-------------|-------------|-------------|--|---------------------------------------------------------------------------|---------------------|
| ITEM              | QTY<br>-041 | QTY<br>-045 | QTY<br>-047 | QTY<br>-049 |  |                                                                           |                     |
| 1                 | X           |             |             |             |  | D2580-041                                                                 | SKIDTUBE ASSEMBLY   |
| 2                 |             | X           |             |             |  | D2580-045                                                                 | SKIDTUBE ASSEMBLY   |
| 3                 |             |             | X           |             |  | D2580-047                                                                 | SKIDTUBE ASSEMBLY   |
| 4                 |             |             |             | X           |  | D2580-049                                                                 | SKIDTUBE ASSEMBLY   |
| 20                | 1           | 1           | 1           | 1           |  | D2500-1-190                                                               | EXTRUSION           |
| 21                |             |             | 16          | 16          |  | D2570                                                                     | BUSHING             |
| 22                | 1           | 1           | 1           | 1           |  | D2576-3                                                                   | STEP                |
| 23                |             | 4           |             |             |  | D2579                                                                     | SPACER              |
| 24                | 16          | 16          | 8           | 8           |  | D2594-1                                                                   | PLUG                |
| 25                | 16          | 16          | 8           | 8           |  | D2594-3                                                                   | O-RING              |
| 26                | 1           | 1           | 1           | 1           |  | D2596                                                                     | 205 WEB             |
| 27                | 1           | 1           | 1           | 1           |  | D2855                                                                     | AFT CAP             |
| 28                | 1           | 1           |             |             |  | D3564-5                                                                   | WEARSHOE            |
| 29                | 1           | 1           |             |             |  | D3564-9                                                                   | WEARSHOE            |
| 30                | 1           | 1           |             |             |  | D3564-11                                                                  | WEARSHOE            |
| 31                | 1           | 1           |             |             |  | D3564-13                                                                  | WEARSHOE            |
| 32                | 2           | 2           |             |             |  | D3566-1                                                                   | GASKET              |
| 33                | 1           | 1           |             |             |  | D3566-5                                                                   | GASKET              |
| 34                | 1           | 1           |             |             |  | D3566-13                                                                  | GASKET              |
| 35                | 20          | 20          | 24          | 24          |  | D4202-1                                                                   | SPACER              |
| 36                |             |             | 1           |             |  | D4406-041                                                                 | WEARPLATE ASSEMBLY  |
| 37                |             |             | 1           |             |  | D4406-043                                                                 | WEARPLATE ASSEMBLY  |
| 37                |             |             |             | 1           |  | D5061-1                                                                   | FWD WEARPLATE       |
| 37                |             |             |             | 1           |  | D5061-3                                                                   | AFT WEARPLATE       |
| 50                | 50          | 50          |             |             |  | ALS7-1032-130<br>or AKS7-1032-130<br>or AKS4-1032-130<br>or AELS-1032-130 | INSERT              |
| 51                | 50          | 50          |             |             |  | AN3C4A                                                                    | BOLT                |
| 52                | 2           | 2           | 2           | 2           |  | AN3-5A                                                                    | BOLT                |
| 53                |             |             | 8           | 8           |  | AN4-45A                                                                   | BOLT                |
| 54                | 50          | 50          |             |             |  | NAS1149C0332R                                                             | WASHER (AN960C10L)  |
| 55                | 2           | 2           | 2           | 2           |  | NAS1149D0332J                                                             | WASHER (AN960JD10L) |
| 56                |             |             | 8           | 8           |  | MS21042-4                                                                 | NUT (OR MS21042L4)  |

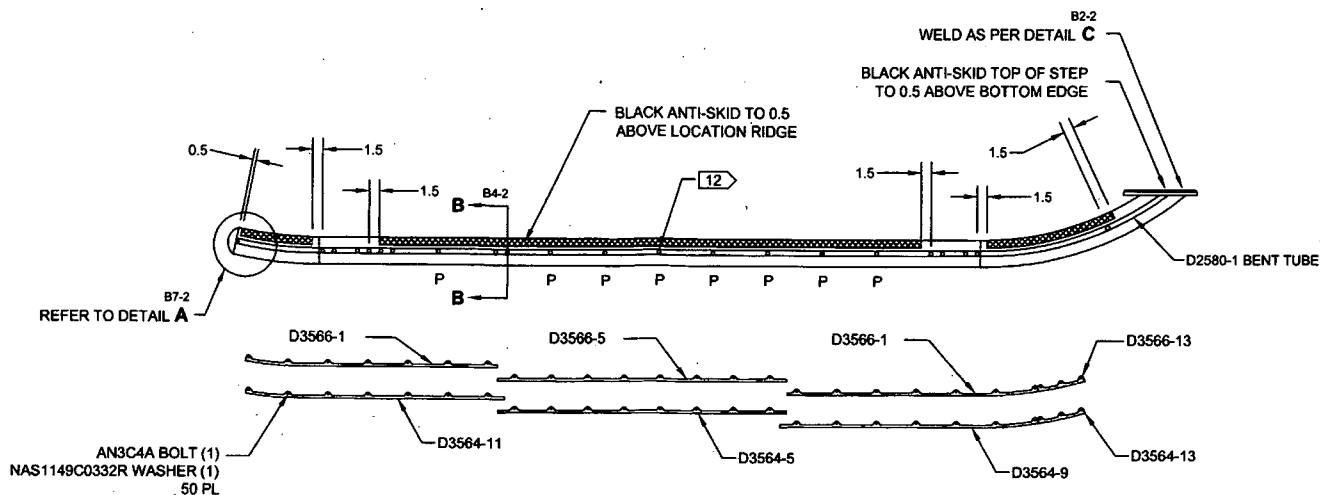
# **GENERAL NOTES:**

- 1) MATERIAL: N/A
- 2) FINISH: CHEMICAL CONVERSION PER DART QSI 005 4.1 PRIOR TO INSERTING D2596 WEB POWDER COAT ASSEMBLY (-041/-047/-049) GLOSS WHITE (REF 4.3.5.1) PER DART QSI 005 4.3 POWDER COAT ASSEMBLY (-045) GREEN SANDTEX (REF 4.3.5.8) PER DART QSI 005 4.3 BLACK ANTI-SKID PAINT AS INDICATED PER DART QSI 005 4.4.
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: NONE
- 7) WEIGHT: D2580-041 = 34.5 lbs  
D2580-045 = 34.5 lbs  
D2580-047 = 45.1 lbs  
D2580-049 = 32.0 lbs
- 8) WELDING PER DART QSI 004.
- 9) INSERT D2596 WEB TO LOCATION SHOWN OFF AFT END OF SKIDTUBE AND BOND WEB INTO OUTER TUBE WITH NON-STRUCTURAL SIKAFLEX-241 ADHESIVE PER DART QSI 015 BEFORE BENDING. ENSURE HOLES LINE-UP.
- 10) BEND AS A SMOOTH RADIUS STARTING WITH A MAXIMUM CENTERLINE RADIUS OF 60 AND ENDING WITH A MINIMUM RADIUS OF 30. A MAXIMUM REDUCTION OF 0.200 IN DIAMETER IS ALLOWABLE IN THE BENT PORTION OF THE TUBE.
- 11) USE DART DRILL TEMPLATE DT8217 & DT8937 ONLY FOR D2580-041/-045 TO LOCATE AND DRILL Ø0.287 HOLES FOR WEARSHOE INSERTS. INSTALL ALS7-1032-130 PER SECTIONS B-B AND F-F (50 PLACES) AFTER FINISH. INSTALL AN3C4A BOLTS AND NAS1149C0332R WASHERS WITH SIKAFLEX-241-291.
- 12) INSERT D2594-1 PLUG CW D2594-3 O-RING IN HOLES MARKED 'P' (BOTH SIDES OF TUBE) AFTER FINISH (16 PLACES FOR D2580-041/-045 AND 8 PLACES FOR D2580-047/-049)
- 13) IT IS ACCEPTABLE TO GRIND A RELIEF IN THE D2855 AFT CAP TO PREVENT INTERFERENCE WITH THE SPACER AT THIS LOCATION

RELEASED  
2014-04-29

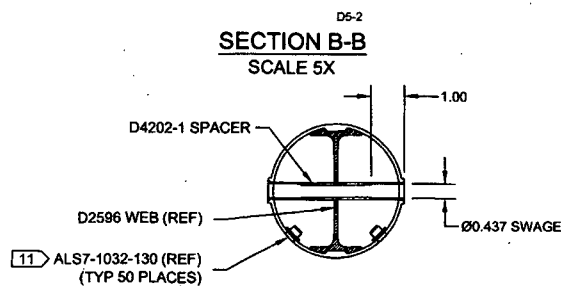
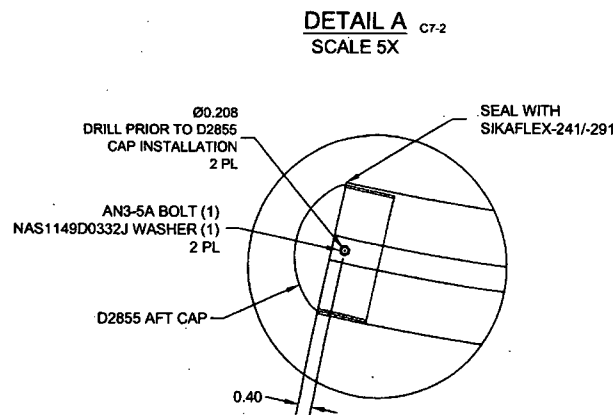
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WITHOUT NOTICE  
WORK ORDER  
NO. 147998 MJS  
160621

|            |                                                                                                                                                           |                                                                                                                                                                                                                                                                             |              |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| G          | ADDED -049, -047 WEIGHT UPDATED PER DSI 9598                                                                                                              | AJS                                                                                                                                                                                                                                                                         | 14.04.09     |
| F          | INCORPORATE DEO D2580-E-1 PER PAR12-218                                                                                                                   | DC                                                                                                                                                                                                                                                                          | 13.06.20     |
| E          | ADD D2580-047 (ZN C4-7) AND D2580-7 (ZN B3-8); INCLUDED DEO D2580-D-1; REFORMATTED DRAWING TO CURRENT STANDARDS; DT8217 & DT8937 WAS TD2577-205 (ZN C4-1) | RF                                                                                                                                                                                                                                                                          | 11.06.21     |
| D          | CHANGE TO SS WEARPLATES AND GASKETS, INCLUDE DEO 9124/ 9183                                                                                               | PH                                                                                                                                                                                                                                                                          | 07.04.05     |
| C          | REDRAWN, INCLUDED DEO 9094/ 9097                                                                                                                          | CP                                                                                                                                                                                                                                                                          | 98.08.26     |
| B          | AS MANUFACTURED                                                                                                                                           | DS                                                                                                                                                                                                                                                                          | 96.12.02     |
| A          | NEW ISSUE                                                                                                                                                 | DS                                                                                                                                                                                                                                                                          | 96.09.16     |
| REV.       | DESCRIPTION                                                                                                                                               | BY                                                                                                                                                                                                                                                                          | DATE         |
| DESIGN     | DS                                                                                                                                                        | <b>DART AEROSPACE LTD</b><br>HAWKESBURY, ONTARIO, CANADA                                                                                                                                                                                                                    |              |
| DRAWN      | AJS                                                                                                                                                       |                                                                                                                                                                                                                                                                             |              |
| CHECKED    | A.P.                                                                                                                                                      | DRAWING NO.                                                                                                                                                                                                                                                                 | REV. G       |
| MFG. APPR. | N                                                                                                                                                         | D2580                                                                                                                                                                                                                                                                       | SHEET 1 OF 9 |
| APPROVED   | 10                                                                                                                                                        | TITLE                                                                                                                                                                                                                                                                       | SCALE        |
| DE APPR.   | 10                                                                                                                                                        | 205 SKIDTUBE ASSEMBLY                                                                                                                                                                                                                                                       | NTS          |
| DATE       | 14.04.09                                                                                                                                                  | <small>COPYRIGHT © 1996 BY DART AEROSPACE LTD<br/>THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR DISCLOSED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small> |              |

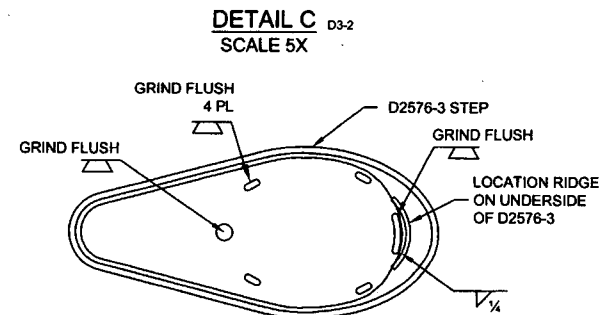


**D2580-041 ASSEMBLY DETAIL**

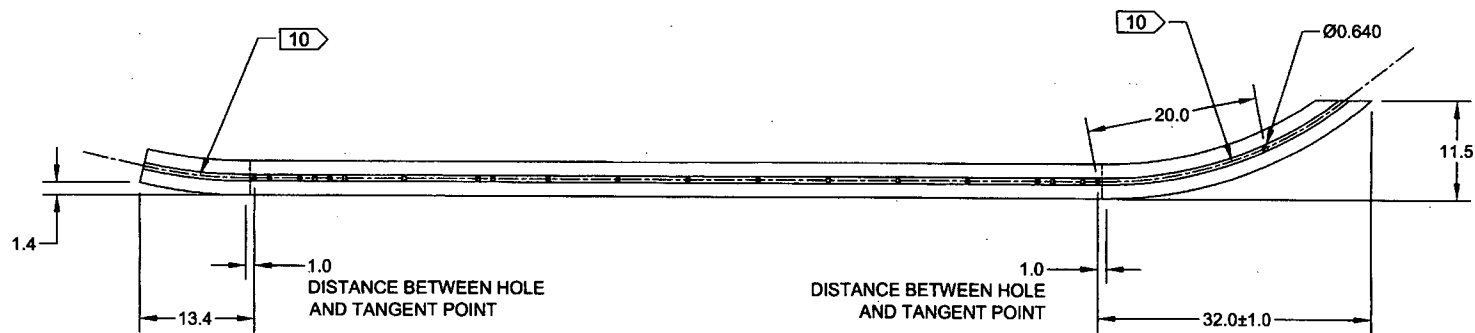
**RELEASED**  
2014-04-28



AFTER DRILLING AND BENDING ASSEMBLY  
PERFORM THE FOLLOWING FOR Ø0.508 HOLES ONLY:  
1. INSERT D4202-1 SPACER (20 PLACES)  
2. SWAGE TO Ø0.437 X 1.00 DEEP PER QSI 002  
3. TRIM / GRIND FLUSH PER QSI 002



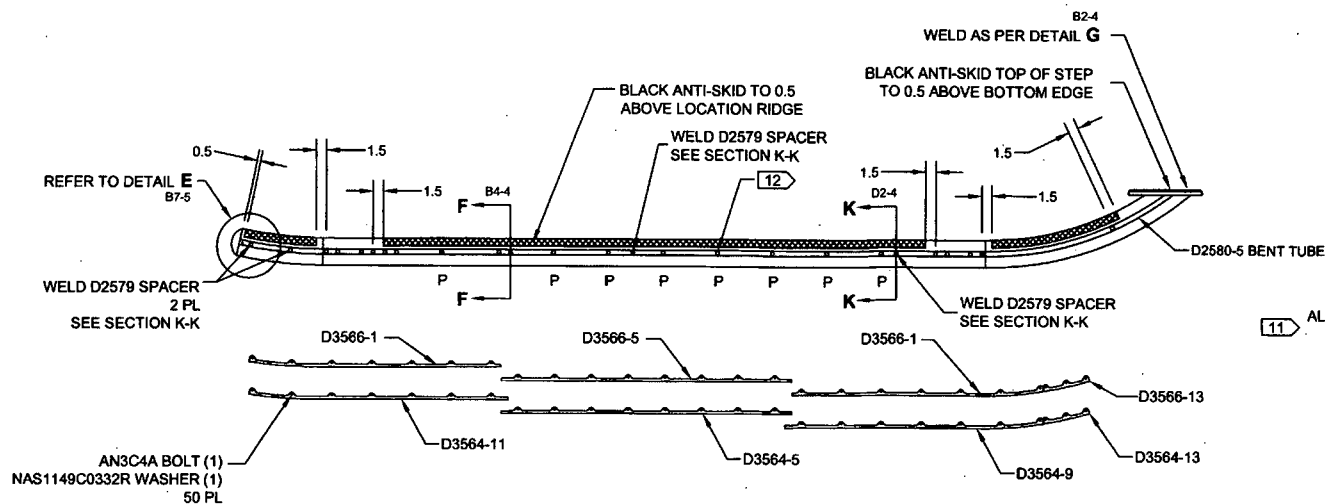
|            |          |                                                                                                                                                                                                                                                                |              |
|------------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| DESIGN     | DS       | <b>DART AEROSPACE LTD</b>                                                                                                                                                                                                                                      |              |
| DRAWN      | AJS      | HAWKESBURY, ONTARIO, CANADA                                                                                                                                                                                                                                    |              |
| CHECKED    | A.P.     | DRAWING NO.                                                                                                                                                                                                                                                    | REV. G       |
| MFG. APPR. |          | D2580                                                                                                                                                                                                                                                          | SHEET 2 OF 9 |
| APPROVED   |          | TITLE                                                                                                                                                                                                                                                          | SCALE        |
| DE APPR.   |          | 205 SKIDTUBE ASSEMBLY                                                                                                                                                                                                                                          | NTS          |
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D2580-1 BENT TUBE  
(MAKE FROM D2580-101 TUBE)

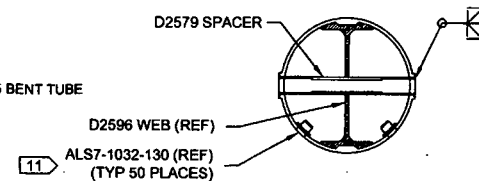
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2014-04-29

|            |                    |                                                                                                                                                                                                                                                                                          |              |
|------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| DESIGN     | DS                 | <b>DART AEROSPACE LTD</b><br>HAWKESBURY, ONTARIO, CANADA                                                                                                                                                                                                                                 |              |
| DRAWN      | AJS                |                                                                                                                                                                                                                                                                                          |              |
| CHECKED    | A.P.               | DRAWING NO.                                                                                                                                                                                                                                                                              | REV. G       |
| MFG. APPR. | <i>[Signature]</i> | D2580                                                                                                                                                                                                                                                                                    | SHEET 3 OF 9 |
| APPROVED   | <i>[Signature]</i> | TITLE                                                                                                                                                                                                                                                                                    | SCALE        |
| DE APPR.   | <i>[Signature]</i> | 205 SKIDTUBE ASSEMBLY                                                                                                                                                                                                                                                                    | NTS          |
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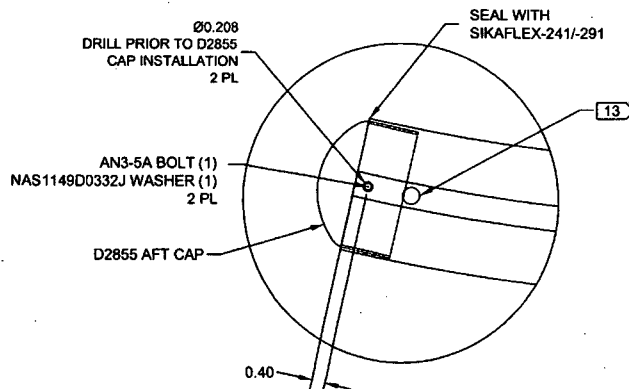
**D2580-045 ASSEMBLY DETAIL**

**SECTION K-K D5-4  
SCALE 5X**

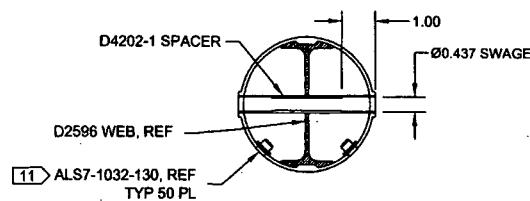


AFTER DRILLING AND BENDING ASSEMBLY  
PERFORM THE FOLLOWING FOR Ø0.508 HOLES ONLY:  
1. CHAMFER HOLE 0.050 X 45°  
2. INSERT D2579 SPACER (4 PLACES)  
3. WELD INTO PLACE AND GRIND FLUSH  
4. DO NOT C-BORE

**DETAIL E D7-4  
SCALE 5X**

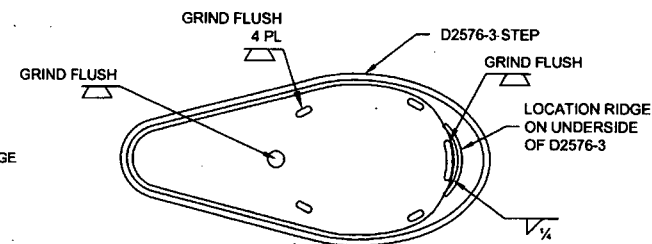


**SECTION F-F D6-4  
SCALE 5X**



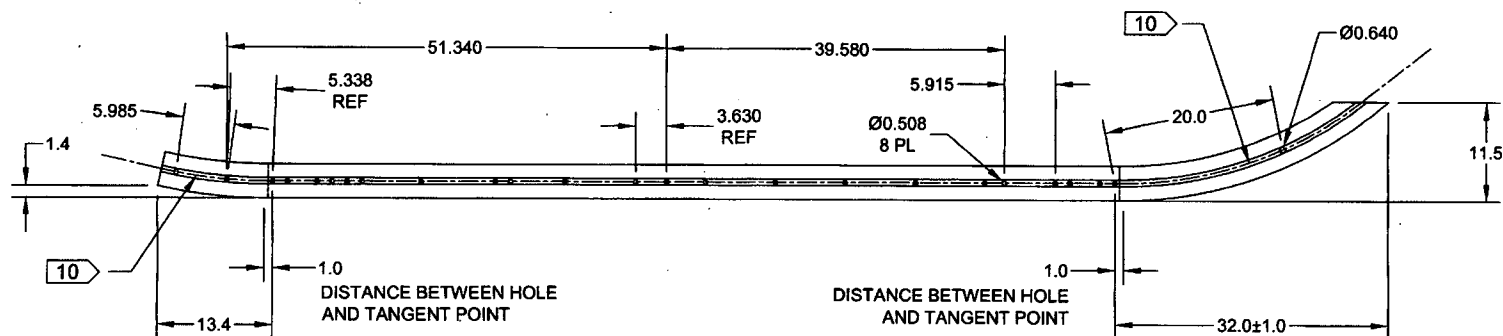
AFTER DRILLING AND BENDING ASSEMBLY  
PERFORM THE FOLLOWING FOR Ø0.508 HOLES ONLY:  
1. INSERT D4202-1 SPACER (20 PLACES)  
2. SWAGE TO Ø0.437 X 1.00 DEEP PER QSI 002  
3. TRIM/GRIND FLUSH PER QSI 002

**DETAIL G D3-4  
SCALE 5X**



|            |          |                                                                                                                                                                                                                                                                                |              |
|------------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| DESIGN     | DS       | <b>DART AEROSPACE LTD</b>                                                                                                                                                                                                                                                      |              |
| DRAWN      | AJS      | HAWKESBURY, ONTARIO, CANADA                                                                                                                                                                                                                                                    |              |
| CHECKED    | AJS      | DRAWING NO.                                                                                                                                                                                                                                                                    | REV. G       |
| MFG. APPR. |          | D2580                                                                                                                                                                                                                                                                          | SHEET 4 OF 9 |
| APPROVED   |          | TITLE                                                                                                                                                                                                                                                                          | SCALE        |
| DE APPR.   |          | 205 SKIDTUBE ASSEMBLY                                                                                                                                                                                                                                                          | NTS          |
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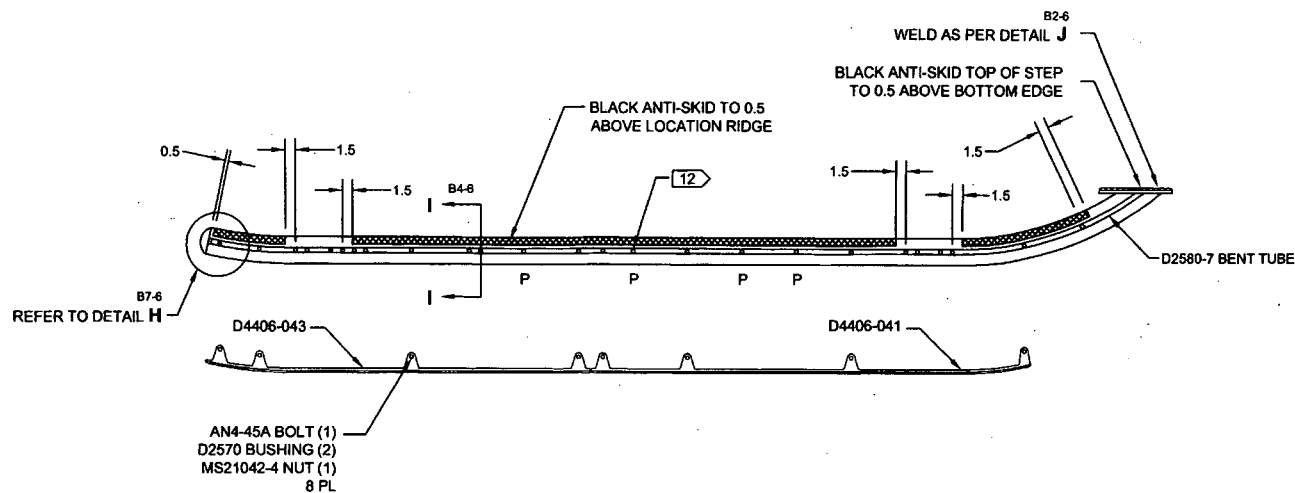
**RELEASED**  
2014-04-29



**D2580-5 BENT TUBE**  
(MAKE FROM D2580-101 TUBE)

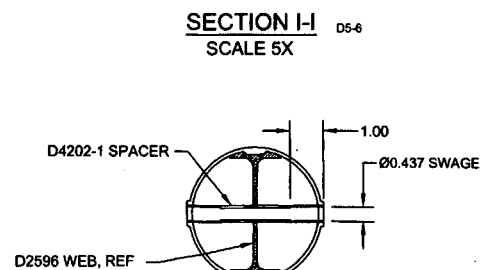
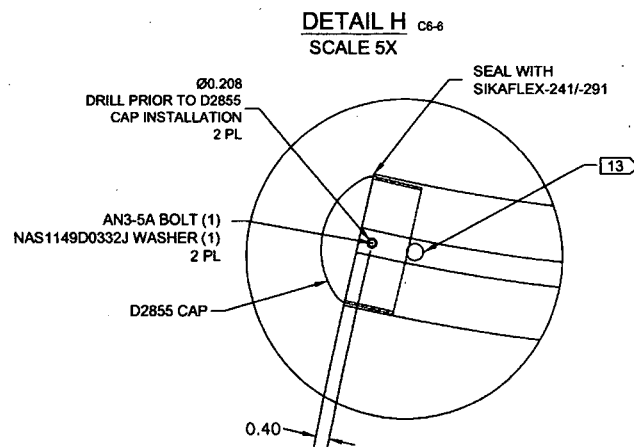
**RELEASED**  
2014-04-29

|            |                    |                                                                                                                                                                                                                                                                                          |              |
|------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| DESIGN     | DS                 | <b>DART AEROSPACE LTD</b><br>HAWKESBURY, ONTARIO, CANADA                                                                                                                                                                                                                                 |              |
| DRAWN      | AJS                |                                                                                                                                                                                                                                                                                          |              |
| CHECKED    | <i>A.P.</i>        | DRAWING NO.                                                                                                                                                                                                                                                                              | REV. G       |
| MFG. APPR. | <i>[Signature]</i> | D2580                                                                                                                                                                                                                                                                                    | SHEET 5 OF 9 |
| APPROVED   | <i>[Signature]</i> | TITLE                                                                                                                                                                                                                                                                                    | SCALE        |
| DE APPR.   | <i>[Signature]</i> | 205 SKIDTUBE ASSEMBLY                                                                                                                                                                                                                                                                    | NTS          |
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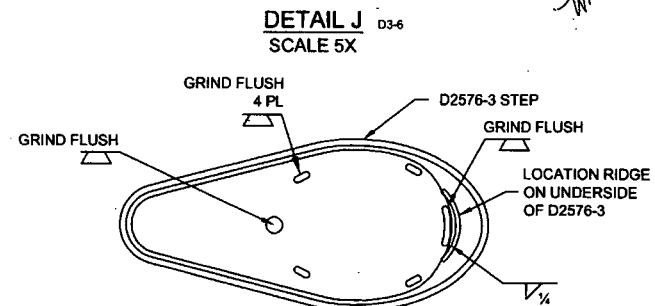


**D2580-047 ASSEMBLY DETAIL**

**RELEASED**  
2014-04-29

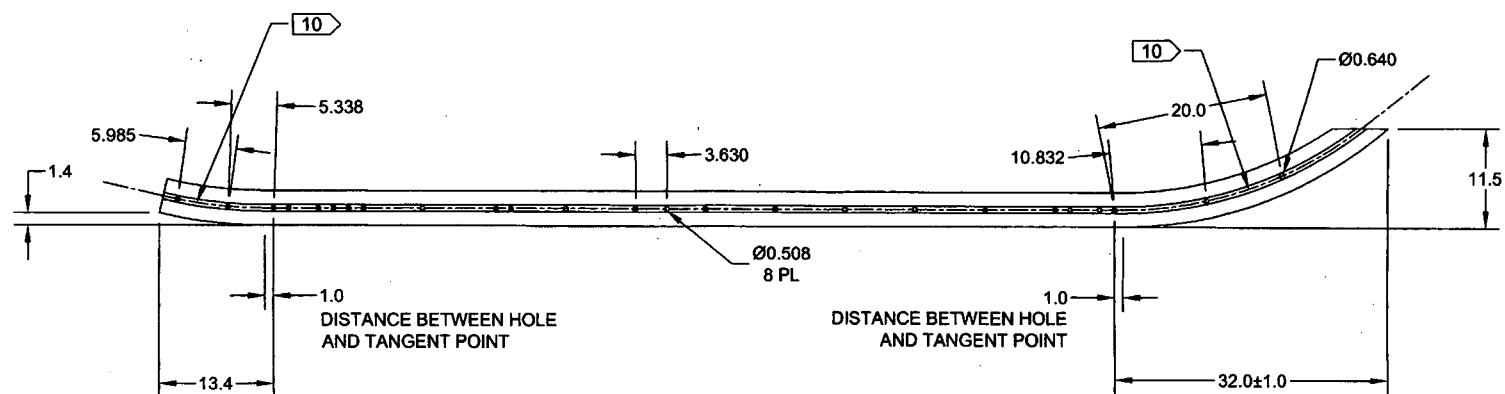


AFTER DRILLING AND BENDING ASSEMBLY  
PERFORM THE FOLLOWING FOR Ø0.508 HOLES ONLY:  
1. INSERT D4202-1 SPACER (24 PLACES)  
2. SWAGE TO Ø0.437 X 1.00 DEEP PER QSI 002  
3. TRIM/GRIND FLUSH PER QSI 002



|            |          |                                                                                                                                                                                                                                                                                |              |
|------------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| DESIGN     | DS       | <b>DART AEROSPACE LTD</b>                                                                                                                                                                                                                                                      |              |
| DRAWN      | AJS      | HAWKESBURY, ONTARIO, CANADA                                                                                                                                                                                                                                                    |              |
| CHECKED    | A.P.     | DRAWING NO.                                                                                                                                                                                                                                                                    | REV. G       |
| MFG. APPR. |          | D2580                                                                                                                                                                                                                                                                          | SHEET 6 OF 9 |
| APPROVED   |          | TITLE                                                                                                                                                                                                                                                                          | SCALE        |
| DE APPR.   |          | 205 SKIDTUBE ASSEMBLY                                                                                                                                                                                                                                                          | NTS          |
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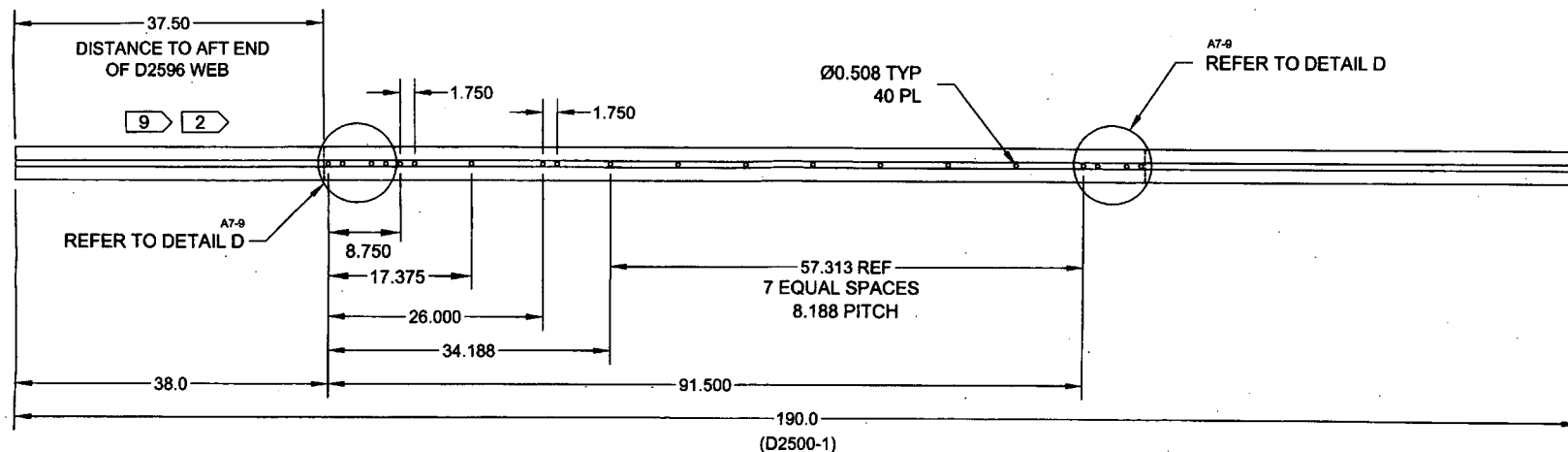


**D2580-7 BENT TUBE**  
(MAKE FROM D2580-101 TUBE)

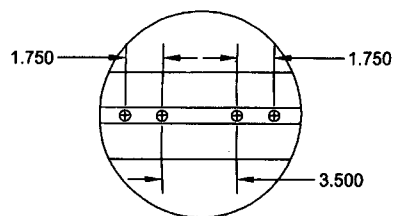
**RELEASED**  
2014-04-29  
WD

|            |             |                                                                                                                                                                                                                                                                                          |              |
|------------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| DESIGN     | DS          | <b>DART AEROSPACE LTD</b><br>HAWKESBURY, ONTARIO, CANADA                                                                                                                                                                                                                                 |              |
| DRAWN      | AJS         |                                                                                                                                                                                                                                                                                          |              |
| CHECKED    | A.P.        | DRAWING NO.                                                                                                                                                                                                                                                                              | REV. G       |
| MFG. APPR. | [Signature] | D2580                                                                                                                                                                                                                                                                                    | SHEET 8 OF 9 |
| APPROVED   | [Signature] | TITLE                                                                                                                                                                                                                                                                                    | SCALE        |
| DE APPR.   | [Signature] | 205 SKIDTUBE ASSEMBLY                                                                                                                                                                                                                                                                    | NTS          |
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D2580-101 TUBE



DETAIL D  
SCALE 5X  
C3-9  
C7-9

RELEASED  
2014-04-29  
DM

|            |          |                                                                                                                                                                                                                                                                                |              |
|------------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| DESIGN     | DS       | DART AEROSPACE LTD<br>HAWKESBURY, ONTARIO, CANADA                                                                                                                                                                                                                              |              |
| DRAWN      | AJS      |                                                                                                                                                                                                                                                                                |              |
| CHECKED    | A.P.     | DRAWING NO.                                                                                                                                                                                                                                                                    | REV. G       |
| MFG. APPR. | AA       | D2580                                                                                                                                                                                                                                                                          | SHEET 9 OF 9 |
| APPROVED   | MP       | TITLE                                                                                                                                                                                                                                                                          | SCALE        |
| DE APPR.   | MP       | 205 SKIDTUBE ASSEMBLY                                                                                                                                                                                                                                                          | NTS          |
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